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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,839	02/09/2004	Gary S. Tompa	16592-2	9769

28221 7590 01/13/2006

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EXAMINER	
HANNAHER, CONSTANTINE	
ART UNIT	**PAPER NUMBER**
2884	

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,839	TOMPA ET AL.	
	Examiner	Art Unit	
	Constantine Hannaher	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 July 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 20040827.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed February 9, 2004 fails to comply with 37 CFR 1.98(a)(1) and (b)(3) effective at the time of filing which required a list of all patents, publications, applications, or other information submitted for consideration by the Office and identification of each U.S. application by inventor, application number, and filing date. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

2. The information disclosure statement filed August 27, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Drawings

3. The drawings were received on July 14, 2004. These drawings are acceptable.

4. The drawings as originally filed included color drawings but the conditions for acceptance were never satisfied.

Specification

5. The disclosure is objected to because of the following informalities: page 2, "well know in the art"; page7, "forth bit".

Appropriate correction is required.

6. Section 608.01 of the MPEP states in part:

> In order to minimize the necessity in the future for converting dimensions... to the metric system of measurements when using printed patents... all patent

applicants should use the metric (S.I.) units followed by the equivalent English units when describing their inventions....

The Assistant Secretary and Commissioner of Patents and Trademark strongly reiterated and emphasized strong encouragement for patent applicants to use the metric system in patent applications in a message appearing at 1135 O.G. 55 dated February 18, 1992. At some future time, the USPTO will consider making it a requirement.

Note the use of the inch and the micron. The Examiner is unable to require the use of SI units.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 10, 18, and 24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Blaes *et al.* (1994).

With respect to independent claim 1, Blaes *et al.* discloses a radiation detector (Fig. 1) comprising an array of memory cells (Fig. 2) and a processor connected to the memory cells and configured to detect a bit flip in one or more of the memory cells (page 319, second paragraph of introduction).

With respect to dependent claim 2, the array of memory cells in the radiation detector of Blaes *et al.* comprises an array of SRAM cells (page 319).

With respect to dependent claim 3, the array of memory cells in the radiation detector of Blaes *et al.* comprises a two-dimensional array (Fig. **1**).

With respect to dependent claim 10, the radiation detector of Blaes *et al.* has a volume in the claimed range (see caption to Fig. **1**).

With respect to independent claim 18, Blaes *et al.* discloses a radiation detector (Fig. **1**) comprising a microelectronic detection circuit (Fig. **2**) and a microprocessor connected to the detection circuit responsive to changes in state of the detection circuit and configured to report the detection (page 319, second paragraph of introduction).

With respect to dependent claim 24, the microelectronic detection circuit in the radiation detector of Blaes *et al.* is one of the members of the recited group (page 319).

9. Claims 1-6, 9, 18, 21, and 24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Horiba *et al.* (US004804848A).

With respect to independent claim 1, Horiba *et al.* discloses a radiation detector **600** (Fig. **1**) comprising an array **100** of memory cells **101** and a processor **103** connected to the memory cells and configured to detect a bit flip in one or more memory cells (column 2, lines 51-65, and column 3, lines 11-20).

With respect to dependent claim 2, the array **100** of memory cells **101** in the radiation detector of Horiba *et al.* comprises an array of SRAM cells (column 4, line 2).

With respect to dependent claim 3, the array **100** of memory cells **101** in the radiation detector of Horiba *et al.* comprises a two-dimensional array (Fig. **1**).

With respect to dependent claim 4, the radiation detector **600** of Horiba *et al.* further includes a plurality of arrays **100, 200, 300** of memory cells (Fig. **1**).

With respect to dependent claim 5, the radiation detector **600** of Horiba *et al.* further includes a stacked plurality of memory cells **101, 201, 301** (Fig. **1**).

With respect to dependent claim 6, the stacked plurality of memory cells in the radiation detector of Horiba *et al.* comprises two stacked arrays of memory cells (column 4, lines 5-6).

With respect to dependent claim 9, the array of memory cells in the radiation detector of Horiba *et al.* comprises a stacked plurality of memory cells (Fig. **1**) and the processor **400** is configured to further detect a direction of an ion (moving along direction **A**) by determining a plurality of wrong bits in the stacked plurality of memory cells (column 3, lines 35-47).

With respect to independent claim 18, Horiba *et al.* discloses a radiation detector (Fig. **1**) comprising a microelectronic detection circuit **100** and a microprocessor **103** connected to the detection circuit responsive to changes in state of the detection circuit and configured to report the detection (column 3, lines 22-27).

With respect to dependent claim 21, the microelectronic detection circuit **100** in the radiation detector of Horiba *et al.* comprises stacked arrays of detector circuits **100, 200, 300** (Fig. **1**).

With respect to dependent claim 24, the microelectronic detection circuit **100** in the radiation detector of Horiba *et al.* is selected from at least one member of the recited group (column 3, line 67 to column 4, line 2).

10. Claims 1-3, 8, 18, and 24 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Layman *et al.* (US006828561B2).

With respect to independent claim 1, Layman *et al.* discloses a radiation detector (Fig. **3**) comprising an array **18** of memory cells (Fig. **1**) and a processor **104** connected to the memory cells and configured to detect a bit flip in one or more of the memory cells (column 6, line 2).

With respect to dependent claim 2, the array **18** of memory cells in the radiation detector of Layman *et al.* comprises an array of SRAM cells (column 3, lines 17-19).

With respect to dependent claim 3, the array **18** of memory cells in the radiation detector of Layman *et al.* comprises a two-dimensional array (Fig. **1**).

With respect to dependent claim 8, the processor **104** in the radiation detector of Layman *et al.* is configured to detect a bit flip by writing a predetermined pattern of binary values in the memory array **18** (abstract, column 4, lines 28-31) and determining a wrong bit in the predetermined pattern (abstract, column 5, lines 55-58).

With respect to independent claim 18, Layman *et al.* discloses a radiation detector (Fig. **3**) comprising a microelectronic detection circuit **102** and a microprocessor **104** connected to the detection circuit responsive to changes in state of the detection circuit and configured to report the detection (column 6, lines 1-8).

With respect to dependent claim 24, the microelectronic detection circuit in the radiation detector of Layman *et al.* is one of the members of the recited group (column 3, line 19).

11. Claims 1, 3, 8, 10, 12, and 18-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hossain *et al.* (US006075261A).

With respect to independent claim 1, Hossain *et al.* discloses a radiation detector **300** (Fig. **3**) comprising an array **310** of memory cells **103** (Fig. **1A**) and a processor **320** connected to the memory cells and configured to detect a bit flip in one or more of the memory cells (column 2, lines 30-46).

With respect to dependent claim 3, the array **310** of memory cells in the radiation detector of Hossain *et al.* comprises a two-dimensional array (Fig. **3**).

With respect to dependent claim 8, the processor **320** in the radiation detector of Hossain *et al.* is configured as recited (column 5, lines 18-44).

With respect to dependent claim 10, the radiation detector of Hossain *et al.* has a volume in the claimed range (column 5, lines 10-13).

With respect to dependent claim 12, the memory cells **103** in the radiation detector of Hossain *et al.* are coated with a material **121** that reacts with radiation to generate ionization (column 2, lines 39-44).

With respect to independent claim 18, Hossain *et al.* discloses a radiation detector (Fig. **3**) comprising a microelectronic detection circuit **310** and a microprocessor **320** connected to the detection circuit responsive to changes in state of the detection circuit and configured to report the detection (column 2, lines 30-46).

With respect to dependent claim 19, the microelectronic detection circuit **310** is further configured to detect secondary interactions caused by radiation (column 2, lines 39-44).

With respect to dependent claim 20, the microelectronic detection circuit **310** is further coated with a material **121** to enhance the detection of radiation.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was

commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba *et al.* (US004804848A).

With respect to dependent claim 7, the stacked plurality of memory cells in the radiation detector of Horiba *et al.* comprises a number of stacked arrays of memory cells (column 4, lines 8-9). In view of the enhanced detection precision described by Horiba *et al.*, it would have been obvious to one of ordinary skill in the art at the time that the suggested range (increased number of layers) encompassed the recited value of ten.

With respect to dependent claim 11, Horiba *et al.* does not describe the memory cells are hardened. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to consider the memory cells **101** as softened.

15. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba *et al.* (US004804848A) in view of Layman *et al.* (US006828561B2).

With respect to independent claim 13, Horiba *et al.* discloses a structure (Fig. **1**) comprising a processor **103** and a plurality of layers of memory cell arrays **100, 200, 300** but the method of detecting radiation ("by reading out the contents of the memory cells") is not specific. Layman *et al.* discloses that a method comprising the steps of distributing a predetermined pattern of binary values in a memory cell array **18** (abstract, column 4, lines 28-31) and determining a particle strike by scanning the memory cell array **18** for a bit flip (abstract, column 5, lines 55-58) is known. In view of

the effective performance of the method of Layman *et al.* in determining the memory cell which has changed state (claim 10) as is required in the reading out in the structure of Horiba *et al.*, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Horiba *et al.* to specify that a predetermined pattern of binary values is distributed to the memory cell arrays and that a particle strike is detected by scanning the memory cell arrays for a bit flip.

With respect to dependent claim 14, since the degree of radiation impingement on the structure of Horiba *et al.* may increase and decrease, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the method suggested by Layman *et al.* periodically.

With respect to dependent claim 15, since there is no time limit on the claim requirement for "after," it would have been obvious to one of ordinary skill in the art at the time the invention was made that in the method of detecting radiation suggested by Horiba *et al.* and Layman *et al.* the algorithm of Fig. **2** in Layman *et al.* would be repeated over the lifetime of the product. Accordingly, after the detection of a particle strike, the predetermined pattern would be restored.

With respect to dependent claims 16 and 17, the recited determinations are disclosed by Horiba *et al.* See the operation of processor **400**.

16. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba *et al.* (US004804848A) in view of Hossain *et al.* (US006075261A).

With respect to dependent claim 22, the radiation detector of Horiba *et al.* is disclosed as a detector of "ionized" radiation. Hossain *et al.* discloses a microelectronic detection circuit **310** which is coated with a material **121** to enhance detection of radiation. Since the coating material of Hossain *et al.* enhances the detection of neutrons which would otherwise not interact with the radiation

detector of Horiba *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the radiation detector of Horiba *et al.* such that each of the stacked arrays **100, 200, 300** of detector circuits was coated with such a material.

With respect to dependent claim 23, the radiation detector of Horiba *et al.* is disclosed as a detector of "ionized" radiation which could also be modified to detect infrared radiation (column 4, lines 18-23). In view of the increased number of layers specifically suggested by Horiba *et al.*, it would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that at least two layers were sensitive to the ionized radiation and at least another two layers were sensitive to infrared radiation in view of the increased capabilities. Hossain *et al.* discloses a microelectronic detection circuit **310** which is coated with a material **121** to enhance detection of radiation. Since the coating material of Hossain *et al.* enhances the detection of neutrons which would otherwise not interact with the radiation detector of Horiba *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the radiation detector of Horiba *et al.* such that at least another two layers were coated with such a material. Accordingly, each of the stacked arrays of detector circuits in such a combination would be sensitized to a particular radiation indicator.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov/. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Constantine Hannaher
Primary Examiner